

WHAT IS CLAIMED IS:

1. A finished laminate, comprising:
an imperforate metal layer having a metallic surface; and
a metallic felt layer having a first surface attached to the metallic surface and an exposed second surface facing away from the metallic surface.
2. A finished laminate according to claim 1, wherein the metallic felt layer is formed from a metal selected from the group consisting of stainless steel, carbon steel and aluminum.
3. A finished laminate according to claim 1, wherein the metallic felt has a basis weight in the range of from about 400 g/m² to about 1600 g/m².
4. A finished laminate according to claim 3, wherein the metallic felt layer has a mean fiber width in the range of from about 40 microns to about 120 microns.
5. A finished laminate according to claim 1, wherein the metallic felt layer is adhesively attached to the metal layer.
6. A finished laminate according to claim 1, wherein the metallic felt layer is welded to the metal layer.
7. A finished laminate according to claim 1, wherein the metallic felt layer is mechanically secured to the metal layer.
8. A finished laminate according to claim 1, wherein the exposed second surface is free of contact or bonded contact with another metal layer.

9. A multi-layer tubing, comprising:
- a thermally conductive metal layer having a metallic surface; and
- a substantially thermally non-conductive, metallic felt layer having an outer felt layer surface attached to the metallic surface and an exposed inner felt layer surface, the metal layer and the metallic felt layer collectively forming a laminate configured as a substantially cylindrical structure with the metallic felt layer positioned radially inward of the metal layer.
10. A multi-layer tubing according to claim 9, wherein the metal the laminate has opposite side edge portions overlapping and coupled to one another at a coupling portion.
11. A multi-layer tubing according to claim 10, wherein the laminate is free of a thermally conductive path through the coupling portion.
12. A multi-layer tubing according to claim 10, wherein the metallic felt layer prevents a thermally conductive path from extending through the coupling portion.
13. A multi-layer tubing according to claim 10, wherein the coupling portion comprises the opposite side edge portions crimped to one another.
14. A multi-layer tubing according to claim 10, wherein the multi-layer tubing is free of a metal wall inward of the metallic felt layer and having overlapping opposite side edge portions coupled at the coupling portion.

15. A multi-layer tubing according to claim 10, wherein the laminate comprises a plurality of layers each configured in a substantially cylindrical structure and coupled at the coupling portion, and wherein the metallic felt layer defines an innermost layer of the laminate.

16. A multi-layer tubing according to claim 9, wherein the metallic felt layer is formed from a fibrous material selected from the group consisting of stainless steel, carbon steel and aluminum.

17. A multi-layer tubing according to claim 9, wherein the metallic felt layer has a basis weight in the range of from about 500 g/m² to about 1500 g/m².

18. A multi-layer tubing according to claim 16, wherein the metallic felt layer has a mean fiber width in the range of about 40 microns to about 120 microns.

19. A multi-layer tubing according to claim 9, wherein the metallic felt layer is welded to the metal layer.

20. A multi-layer tubing, comprising:
a thermally conductive metal layer having a metallic surface; and
a substantially thermally non-conductive, metallic felt layer having an outer felt layer surface attached to the metallic surface and an inner felt layer surface, the metal layer and the metallic felt layer collectively forming a laminate having opposite side edge portions overlapping and coupled to one another at a coupling portion to configure the laminate as a substantially

cylindrical structure with the metallic felt layer positioned radially inward of the metal layer, wherein the laminate is free of a thermally conductive path through the coupling portion.

21. A multi-layer tubing according to claim 20, wherein the metallic felt layer prevents the thermally conductive path from extending through the coupling portion.

22. A multi-layer tubing according to claim 20, wherein the coupling portion comprises the opposite side edge portions crimped to one another.

23. A multi-layer tubing according to claim 20, wherein the multi-layer tubing is free of a metal wall inward of the metallic felt layer and having overlapping opposite side edge portions coupled at the coupling portion.

24. A multi-layer tubing according to claim 20, wherein the laminate comprises a plurality of layers each configured in a substantially cylindrical structure and coupled at the coupling portion, and wherein the metallic felt layer defines an innermost layer of the laminate.

25. A multi-layer tubing according to claim 20, wherein the metallic felt layer is formed from a fibrous material selected from the group consisting of stainless steel, carbon steel and aluminum.

26. A multi-layer tubing according to claim 20, wherein the metallic felt layer has a basis weight in the range of from about 500 g/m² to about 1500 g/m².

27. A multi-layer tubing according to claim 26, wherein the metallic felt layer has a mean fiber width in the range of about 40 microns to about 120 microns.

28. A multi-layer tubing according to claim 20, wherein the metallic felt layer is welded to the metal layer.

29. A thermally insulated assembly, comprising:
a thermally conductive structure; and
a multi-layer tubing comprising a thermally conductive metal layer and a substantially thermally non-conductive, metallic felt layer, the metallic felt layer having inner and outer felt layer surfaces, the inner felt layer surface surrounding the thermally conducting structure, the outer felt layer surface surrounded by and attached to an inner surface of the metal layer, the metal layer and the metallic felt layer collectively forming a laminate having opposite side edge portions overlapping and coupled to one another at a coupling portion to configure the laminate as a substantially cylindrical structure with the metallic felt layer positioned radially between the metal layer and the thermally conductive structure.

30. A thermally insulated assembly according to claim 29, wherein the laminate is free of a thermally conductive path through the coupling portion.

31. A thermally insulated assembly according to claim 29, wherein the metallic felt layer physically separates and prevents direct thermal

communication between the thermally conductive structure from the metal layer.

32. A thermally insulated assembly according to claim 29, wherein the thermally conductive structure is tubular and has a central passageway for the passage of fluid.

33. A thermally insulated assembly according to claim 32, wherein the thermally conductive structure comprises an automotive exhaust pipe.

34. A thermally insulated assembly according to claim 29, wherein the thermally conductive structure is free of side edge portions overlapping with and coupled to the multi-layer tubing at the coupling portion.

35. A thermally insulated assembly according to claim 29, wherein the coupling portion is crimped.

36. A thermally insulated assembly according to claim 29, wherein the metallic felt layer is formed from a metallic material selected from the group consisting of stainless steel, carbon steel and aluminum.

37. A thermally insulated assembly according to claim 29, wherein the metallic felt layer has a basis weight in the range of from about 500 g/m² to about 1500 g/m².

38. A thermally insulated assembly according to claim 37, wherein the metallic felt layer has a mean fiber width in the range of about 40 microns to about 120 microns.

39. A thermally insulated assembly according to claim 29, wherein the metallic felt layer is welded to the metal layer.

40. A method for thermally insulating a thermally conductive structure, comprising:

providing a laminate comprising a thermally conductive metal layer and a substantially thermally non-conductive, metallic felt layer, the metallic felt layer having an outer felt layer surface attached to the metal layer and an exposed inner felt layer surface, the laminate further comprising opposite side edge portions; and

arranging the laminate around the thermally conductive structure.

41. A method according to claim 40, further comprising:

overlapping and coupling the opposite side edge portions of the laminate to one another at a coupling portion to configure the laminate as a substantially cylindrical structure with the metallic felt layer positioned radially between the metal layer and the thermally conductive structure.

42. A method according to claim 41, wherein the laminate is free of a thermally conductive path through the coupling portion.

43. A method according to claim 41, wherein the metallic felt layer physically separates and prevents direct thermal communication between the thermally conductive structure from the metal layer.

44. A method according to claim 41, wherein the thermally conductive structure is tubular and has a central passageway for the passage of fluid.

45. A method according to claim 44, wherein the thermally conductive structure comprises an automotive exhaust pipe.

46. A method according to claim 41, wherein the thermally conductive structure is free of side edge portions overlapping with and coupled to the substantially cylindrical structure at the coupling portion.

47. A method according to claim 41, wherein the coupling portion is crimped.

48. A method according to claim 41, wherein the metallic felt layer is formed from a metallic material selected from the group consisting of stainless steel, carbon steel and aluminum.

49. A method according to claim 41, wherein the metallic felt layer has a basis weight in the range of from about 500 g/m² to about 1500 g/m².

50. A method according to claim 48, wherein the metallic felt layer has a mean fiber width in the range of about 40 microns to about 120 microns.

51. A method according to claim 41, wherein the metallic felt layer is welded to the metal layer.